

IN THE CLAIMS:

- 1 1. (PREVIOUSLY PRESENTED) In a data network comprising a plurality of nodes, a
2 method for transferring data packets between a source node and a destination node con-
3 tained in the network, wherein the source node and destination node belong to the same
4 virtual-local-area network (VLAN), the method comprising the steps of:
5 establishing a virtual port associated with the destination node, the virtual port
6 supporting a plurality of connections, a particular connection associated with the VLAN;
7 acquiring a data packet from the source node, wherein the packet is associated
8 with the VLAN and contains a destination address associated with the destination node;
9 and
10 transferring the packet to the destination node over the particular connection via
11 the virtual port.
- 1 2. (PREVIOUSLY PRESENTED) The method as defined in claim 1 comprising the step
2 of:
3 applying a port identifier (ID) associated with the virtual port to an interface de-
4 scriptor block (IDB) database to identify an IDB database entry associated with the vir-
5 tual port.
- 1 3. (PREVIOUSLY PRESENTED) The method as defined in claim 2 wherein the identi-
2 fied IDB database entry contains a VLAN ID that represents the VLAN associated with
3 the packet.
- 1 4. (PREVIOUSLY PRESENTED) The method as defined in claim 1 wherein the packet
2 contains a VLAN ID that represents the VLAN associated with the packet.

1 5. (PREVIOUSLY PRESENTED) The method as defined in claim 1 comprising the steps
2 of:

3 applying the destination address contained in the packet and a VLAN ID that
4 identifies the VLAN associated with the packet to a forwarding database to locate a for-
5 warding database entry that contains (i) a destination address that matches the destination
6 address contained in the packet and (ii) a VLAN ID that matches the VLAN ID that iden-
7 tifies the VLAN associated with the packet; and
8 identifying a virtual port associated with the destination node using a port identi-
9 fier contained in the matching forwarding database entry.

1 6. (PREVIOUSLY PRESENTED) The method as defined in claim 1 comprising the steps
2 of:

3 applying a port identifier (ID) associated with the virtual port to an interface de-
4 scriptor block (IDB) database to identify an IDB database entry associated with the vir-
5 tual port;
6 locating a virtual port (VPORT) VLAN database using an address contained in
7 the IDB database entry;
8 applying a VLAN ID that identifies the VLAN associated with the packet to the
9 VPORT VLAN database to locate a VPORT VLAN database entry that contains a VLAN
10 ID that matches the VLAN ID that identifies the VLAN associated with the packet;
11 encapsulating the packet; and
12 transferring the encapsulated packet over a particular connection identified by a
13 connection ID contained in the matching VPORT VLAN database entry.

1 7. (PREVIOUSLY PRESENTED) The method as defined in claim 6 wherein the packet
2 is encapsulated in accordance with the Institute of Electrical and Electronics Engineers
3 (IEEE) 802.1Q standard.

1 8. (PREVIOUSLY PRESENTED) The method as defined in claim 6 comprising the steps
2 of:

3 acquiring the encapsulated packet;
4 decapsulating the acquired encapsulated packet to yield the original packet;
5 applying the destination address contained in the original packet to an address
6 translation database to determine if the destination address matches an internal address
7 contained in an entry in the database; and
8 if so, replacing the destination address in the original packet with an external ad-
9 dress contained in the matching entry.

1 9. (PREVIOUSLY PRESENTED) The method as defined in claim 1 wherein the particu-
2 lar connection is a point-to-point protocol (PPP) connection.

1 10. (PREVIOUSLY PRESENTED) The method as defined in claim 1 wherein the par-
2 ticular connection is an Asynchronous Transfer Mode (ATM) virtual connection (VC).

1 11. (PREVIOUSLY PRESENTED) The method as defined in claim 1 wherein the par-
2 ticular connection is a frame relay connection.

1 12. (PREVIOUSLY PRESENTED) The method as defined in claim 1 wherein the par-
2 ticular connection is a trunked connection.

1 13. (PREVIOUSLY PRESENTED) The method as defined in claim 1 wherein the par-
2 ticular connection is associated with a connection identifier (ID).

1 14. (PREVIOUSLY PRESENTED) The method as defined in claim 13 comprising the
2 step of:
3 identifying an entry in a VLAN ID database that contains a virtual connection
4 (VC) ID that matches the connection ID.

1 15. (PREVIOUSLY PRESENTED) The method as defined in claim 13 comprising the
2 steps of:

3 acquiring an encapsulated packet on the particular connection;
4 identifying an internal VLAN ID associated with the particular connection's ID;
5 and
6 doubly encapsulating the encapsulated packet wherein the doubly encapsulated
7 packet contains the internal VLAN ID.

1 16. (PREVIOUSLY PRESENTED) The method as defined in claim 15 wherein the dou-
2 bly encapsulated packet is encapsulated in accordance with the Institute of Electrical and
3 Electronics Engineers (IEEE) 802.1Q standard.

1 17. (PREVIOUSLY PRESENTED) The method as defined in claim 15 comprising the
2 steps of:

3 applying a destination address contained in the doubly encapsulated packet to an
4 address translation database to determine if the destination address matches an external
5 address contained in an entry in the address translation database; and
6 if so, replacing the destination address contained in the doubly encapsulated
7 packet with an internal address contained in the matching entry.

1 18. (PREVIOUSLY PRESENTED) In a data network comprising a plurality of nodes, a
2 method for transferring data packets between a source node and a destination node con-
3 tained in the network, wherein the source node and destination node belong to the same
4 virtual-local-area network (VLAN), the method comprising the steps of:

5 generating a data packet at the source node, wherein the data packet contains a
6 destination address associated with the destination node;

7 transferring the packet to a source intermediate node contained in the network;

8 at the source intermediate node, (i) acquiring the packet, (ii) identifying a VLAN
9 associated with the packet, (iii) identifying a virtual port through which the destination

10 node may be reached, the virtual port supporting a plurality of connections, (iv) identify-
11 ing a particular connection that is associated with the virtual port and the packet's VLAN,
12 and (v) transferring the packet over the particular connection via the virtual port to a des-
13 tination intermediate node contained in the network; and

14 at the destination intermediate node, (i) acquiring the packet, (ii) identifying a port
15 through which the destination node may be reached and (iii) forwarding the acquired
16 packet to the destination node.

1 19. (PREVIOUSLY PRESENTED) A method as defined in claim 18 comprising the step
2 of:

3 at the source intermediate node, encapsulating the packet.

1 20. (PREVIOUSLY PRESENTED) The method as defined in claim 19 wherein the
2 packet is encapsulated in accordance with the Institute of Electrical and Electronics Engi-
3 neers (IEEE) 802.1Q standard.

1 21. (PREVIOUSLY PRESENTED) The method as defined in claim 18 wherein the par-
2 ticular connection is a point-to-point protocol (PPP) connection.

1 22. (PREVIOUSLY PRESENTED) The method as defined in claim 18 wherein the par-
2 ticular connection is an Asynchronous Transfer Mode (ATM) virtual connection (VC).

1 23. (PREVIOUSLY PRESENTED) The method as defined in claim 18 wherein the par-
2 ticular connection is a frame relay connection.

1 24. (PREVIOUSLY PRESENTED) The method as defined in claim 18 wherein the par-
2 ticular connection is a trunked connection.

1 25. (PREVIOUSLY PRESENTED) An intermediate node comprising:

2 a line card coupled to a network wherein the line card is configured to acquire
3 data packets containing destination addresses; and

4 a processor configured to (i) establish one or more virtual ports wherein each vir-
5 tual port is associated with a plurality of connections and each connection is associated
6 with a virtual-local-area network (VLAN), (ii) associate an acquired packet with a
7 VLAN, (iii) identify a virtual port associated with a destination address contained in the
8 acquired packet, (iv) identify a particular connection associated with the VLAN and (v)
9 transfer the packet over the particular connection via the virtual port.

1 26. (PREVIOUSLY PRESENTED) The intermediate node as defined in claim 25
2 wherein the connections are a combination of connection types.

1 27. (PREVIOUSLY PRESENTED) A apparatus for transferring data packets between a
2 source node and a destination node contained in a data network, wherein the source node
3 and destination node belong to the same virtual-local-area network (VLAN), the appa-
4 ratus comprising:

5 means for establishing a virtual port associated with the destination node, the vir-
6 tual port supporting a plurality of connections, a particular connection associated with the
7 VLAN;

8 means for acquiring a data packet from the source node, wherein the packet is as-
9 sociated with the VLAN and contains a destination address associated with the destina-
10 tion node; and

11 means for transferring the packet to the destination node over the particular con-
12 nection via the virtual port.

1 28. (PREVIOUSLY PRESENTED) A computer readable medium comprising computer
2 executable instructions for execution in a processor, the medium comprising instructions
3 for:

4 establishing a virtual port that is associated with a destination node, contained in a
5 data network, the virtual port supporting a plurality of connections, a particular connec-
6 tion associated with a virtual-local-area network (VLAN);
7 acquiring a data packet wherein the packet is associated with the VLAN and con-
8 tains a destination address associated with the destination node; and
9 transferring the packet to the destination node over the connection via the virtual
10 port.